

APPLICANT'S REMARKS REGARDING REJECTION OF CLAIMS 1-20 UNDER 35 U.S.C. 103 (a)

In the June 30, 2004 Office Action relating to US Application number 09/884,562, the Examiner rejected Claims 1-20 under 35 U.S.C. 103(a) as unpatentable over Erteza US 5,706,114 (Erteza); Erteza in view of Labeyrie US 6,044,102 (Labeyrie); and Erteza in view of Acampora US 6,049,593 (Acampora).

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to those of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 94F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

REJECTION OF CLAIMS 1, 9 AND 16 UNDER 35 U.S.C. 103(a) AS UNPATENTABLE OVER ERTEZA

In the rejection of Claims 1, 9, and 16, the Examiner states that "broadcasting said transformed modulated optical energy into a volume by reflecting said transformed modulated optical energy from a body" would have been obvious to one of ordinary skill in the art at the time of invention because *optical energy flows out from a light source in a canonical shape since light originates a finite source and disperses evenly from a central point producing a cone shape*. (Emphasis added) In making this rejection, the Examiner has mischaracterized at least a portion of Claims 1, 9 and 16 as claiming a

conical shaped flow of optical energy, which is obvious to those skilled in the art. The present invention, however, does not rely on basic principles of optic energy to disperse the transformed modulated optical energy throughout the free-space volume. Instead, the present invention advantageously utilizes an optic dispersion device to disperse the optic energy throughout the free-space volume. In particular, Claim 9 claims, *inter alia*, “a dispersive element in optical communication with said plurality of optical sources” (Claim 9, lines 3-4) and Claims 1 and 16 claim, *inter alia*, “reflecting said transformed modulated optical energy from a [body]” (Claim 1, lines 14-15; Claim 16, lines 16-17). Also, as shown in FIG. 3 and 4, the optic energy flow dispersed by the diversion device does not result in a conical shape flow originating from the optic transmitter, but disperses the optic energy at some angle to the axis of the optic energy flow. The present invention also utilizes a focusing device to impinge the optical energy onto the maximum surface area of the dispersive device. Using either device is clearly not relying on the basic principles of light for dispersing optical energy throughout a free-space volume. Erteza does not teach or suggest using a dispersive device and does not provide any suggestion or motivation for including a dispersive device. Furthermore, the Examiner has not met his initial burden of providing some suggestion of the desirability of dispersing the transformed modulated optical energy throughout the volume using the elements of the present invention. As stated in the MPEP, “To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” *Ex parte*

*Clapp*, 227 USPQ 972, 973 (*Bd. Pat. App. & Inter.* 1985). The Examiner does not cite, and there is no evidentiary support in the record for concluding that the inclusion of either a “dispersion device having a body with a reflective surface” or a focusing device would have been obvious. For the foregoing reasons, Applicant respectfully disagrees with the Examiner’s position that the present invention is obvious and therefore unpatentable over Erteza, and requests that Claims 1, 9, and 16, as well as any claims depending from Claims 1, 9, and 16, be allowed.

II. REJECTION OF CLAIMS 3, 18 AND 20 UNDER 35 U.S.C. 103(a) AS UNPATENTABLE OVER ERTEZA

In addition to rejecting all claims depending from Claims 1, 9, and 16, the Examiner rejected Claims 3, 18 and 20 as unpatentable over Erteza because Erteza disclosed “wherein broadcasting said transformed modulated optical energy into a volume further includes dispersing said transformed modulated optical energy into said volume by reflecting said transformed modulated optical energy from a reflective surface.” In making this statement, the Examiner has misapplied the use of Erteza’s reflective surface. Erteza’s holographic elements might be reflective, but are not separate from the transforming holographic elements, and are not capable of dispersing optic energy with a desired flow shape, but instead are connected to a plate and each holographic element is used either to guide signals through the plate to a second holographic element or to convert a guided signal to a non-guided signal for propagation throughout the volume. In this respect, Erteza does not describe an optic dispersion device similar to the present invention, in which transformed modulated optical energy is impinged onto a surface of a dispersive element having a shape adapted to propagate the transformed modulated optical energy throughout the volume with a desired flow shape. For example, reflecting

the transformed modulated optical energy off a conical surface a body results in one flow shape (seen in FIG. 3), whereas reflecting the transformed modulated optical energy off a hyperbolic surface results in another flow shape (seen in FIG. 4). (See, page 9, line 28 – page 10, line 15). The present invention has features and capabilities not attainable by Erteza, and the Examiner is unable to cite a reference or references that would suggest or teach the present invention. For the foregoing reasons, Applicant respectfully disagrees with the Examiner's position that Erteza discloses reflecting the optical energy from a reflective surface, and requests that Claims 3, 18, and 20, as well as any claims that depend from them, be allowed.

III. REJECTION OF CLAIMS 4, 10, 11, AND 19 UNDER 35 U.S.C. 103(a) AS UNPATENTABLE OVER ERTEZA

In rejecting Claims 4, 10, 11, and 19 as unpatentable over Erteza, the Examiner correctly points out that Erteza does not disclose “wherein broadcasting said transformed modulated optical energy into a volume further includes propagating a toroidal sheet of transformed modulated optical energy into said volume by reflecting said transformed modulated optical energy from a surface having a hyperbolic shape.” However, the Examiner is incorrect in concluding that the dispersion of optical energy by reflecting the optic energy from a surface having a hyperbolic shape results in a toroidal shape that is merely a canonical dispersion of light ...since light originates a finite source and disperses evenly from a central point producing a cone shape. In fact, the present invention sees advantages in controlling the dispersion of optical energy, which may be accomplished using a hyperbolic surface, a conical surface, or a faceted surface. Utilizing optic dispersion devices having different reflective surfaces, the present invention capabilities not attainable by Erteza, and not suggested or described by Erteza.

Furthermore, the Examiner is unable to cite a reference or references that would suggest or teach reflecting optical energy off a reflective surface to achieve a desired flow shape. For the foregoing reasons, Applicant respectfully disagrees with the Examiner's position that it would have been obvious to one of ordinary skill in the art to reflect the optical energy from a hyperbolic surface, and requests that Claims 4, 10, 11, and 19, as well as any claims that depend from them, be allowed.

#### IV. REJECTION OF CLAIMS 5 AND 12 UNDER 35 U.S.C. 103(a) AS UNPATENTABLE OVER ERTEZA

The Examiner rejects Claims 5 and 12 under 35 U.S.C. 103(a), asserting that Erteza disclosed "wherein broadcasting said transformed modulated optical energy into a volume further includes radiating said transformed modulated optical energy into said volume over a plurality of directions by reflecting said transformed modulated optical energy from a surface having a plurality of planar regions formed thereon" and cites the polyhedron shapes of Figure 2 in Erteza. However, Erteza describes "[the] holograms within the [holographic optical] elements route optical signals to accomplish the desired interconnection." (See, Col. 3, lines 36-38). The present invention includes optic dispersion devices to ensure the optical energy from each of the individual transmitters of arrays are dispersed throughout the volume and sensed by the detectors, and optical energy is reflected off of the planar surfaces of the dispersive element, and not off a reflective holographic element as described in Erteza. For the foregoing reasons, Applicant respectfully disagrees with the Examiner's position that Erteza discloses reflecting the transformed modulated optical energy from a surface having a plurality of planar regions, and requests that Claims 5 and 12, as well as any claims that depend from them, be allowed.

V. REJECTION OF CLAIMS 2 AND 17 UNDER 35 U.S.C. 103(a) AS UNPATENTABLE  
OVER ERTEZA IN VIEW OF LABEYRIE

In rejecting Claims 2 and 17 as unpatentable over Erteza in view of Labeyrie, the Examiner correctly points out that Erteza does not disclose "wherein sensing said data energy further includes performing an inverse transform on said transformed modulated optical energy, with one of said pair of holographic transform functions associated with said pair of computing environments, before sensing said modulated optical energy, to retrieve said modulated optical energy," but asserts that Labeyrie US 6,044,102 (Labeyrie) discloses "using an inverse holographic transform on a signal." The Examiner further asserts that it would have been obvious to use an inverse transform function on said modulated energy to translate the signal from optical to electrical form as discussed in Labeyrie. However, Labeyrie generally involves optically transmitting information through an optical fiber, and portions of Labeyrie teach away from the present invention. For example, Labeyrie admits, "the electrode behavior is indeed of the linear type when the exciting voltages remain relatively low. For high emission levels, there may appear non linear behaviors, and the spectrum emitted at one instant is no longer a simple exact Fourier transform of the exciting signals." (See, Col. 6, lines 60-65). The present invention, however, includes detectors that are associated with only one holographic transform function. With this configuration, each holographic multiplexing subsystem may transform optical energy transmitted thereby with any one of the holographic transform functions, but may sense information so long as the same has been transformed with the holographic transform functions therewith. (See, page 8, lines 6-18). If there is no longer a simple exact Fourier transform of the exciting signal, it might not be possible to have an inverse transform function. The present invention advantageously utilizes

inverse transform functions so that information contained in the transformed optical energy may be sensed only by a sensor associated with a matching holographic transform function. Such a system facilitates concurrent communication between computer environments of the network over a common volume while avoiding cross-talk.

The fact that Erteza does not disclose all the elements associated with Claims 2 and 17 and Labeyrie describes an invention that teaches away from the present invention indicates the present invention was not obvious to those of ordinary skill in the art at the time of invention. For this reason, Applicant respectfully disagrees with the Examiner's position that the present invention as claimed in Claims 2 and 17 is unpatentable, and requests that Claims 2 and 17, as well as any claims that depend therefrom, be allowed.

VI. REJECTION OF CLAIMS 6 AND 13 UNDER 35 U.S.C. 103(a) AS UNPATENTABLE OVER ERTEZA IN VIEW OF ACAMPORA

In rejecting Claims 6 and 13 as unpatentable over Erteza in view of Acampora, the Examiner correctly points out that Erteza does not disclose utilizing the invention wherein one of said computing environments is located on a first building or vehicle and the remaining computing environments are located in a building or vehicle, but asserts that Acampora US 6,049,593 (Acampora) discloses a wireless network that can be used intra-building and from building to vehicle. The Examiner further states it would have been obvious to one of ordinary skill in the art at the time of invention to place the holographic transceivers in various locations as claimed since it is well known that information is transferred between sites such as building and with mobile users such as in vehicles.

Acampora is directed to hybrid universal broadband telecommunications using small radio cells interconnected by free-space optical lengths, and in the preferred

embodiment, the picocellular base stations are interconnected by a dense mesh of highly focused, free-space optical or millimeter wave links which are physically short in length, and are *highly focused*. (Emphasis added) (See, Acampora, Col. 5, lines 8-21; 31-32). Continuing, Acampora states “[b]ecause the footprint of a picocell is so small, its bandwidth is shared by only a small number of users, and each user thereby enjoys broadband service. By re-using the radio spectrum sufficiently often, the problem of limited availability of spectrum is surmounted.” (See, Col. 6, lines 1-6). Acampora’s use of small picocells of radio broadband coupled with a system of highly focused optical communication to overcome the shortcomings of multiple computing environments communicating over a common volume (free-space) represents an alternative solution than the present invention, which describes the transfer of data between computing environments through the use of holographic transform functions. Applicant asserts the teachings of Acampora in combination with Erteza do not suggest or motivate the present invention and Acampora actually teaches an alternative system, which teaches away from the present invention.

An advantage to the present invention is that each holographic transform function associated with a detector (which is uniquely associated with a computing environment) differs from the holographic transform functions associated with the remaining detectors (and therefore other computing environments). Therefore, the shortcomings of prior art, such as cross-talk, are surmounted because instead of relying on highly focused, point to point communication by optical means, the present invention is capable of broadcasting optical energy to a plurality of computing environments, but only computing environments having a detector with a unique transform function will be able to sense the



information contained within the optical energy. Applicant respectfully disagrees with the Examiner's position that Erteza in view of Acampora teach or suggest all the elements of the present invention, and requests that Claims 6 and 13, as well as any claims that depend from them, be allowed.

VII. REJECTION OF CLAIMS 7 AND 14, AND 8 AND 15, UNDER 35 U.S.C. 103(a) AS UNPATENTABLE OVER ERTEZA IN VIEW OF ACAMPORA

Similar to the rejection of Claims 6 and 13, in rejecting Claims 7-8 and 14-15 as unpatentable over Erteza in view of Acampora, the Examiner correctly points out that Erteza does not disclose utilizing the invention wherein one of said computing environments is located on a first building or vehicle and the remaining computing environments are located in a building or vehicle, but asserts that Acampora US 6,049,593 (Acampora) discloses a wireless network that can be used intra-building and from building to vehicle. The Examiner further states it would have been obvious to one of ordinary skill in the art at the time of invention to place the holographic transceivers in various locations as claimed since it is well known that information is transferred between sites such as building and with mobile users such as in vehicles.

Acampora discusses a first aspect of his invention as equivalent to be embodied in a dual-spectrum telecommunications method, in which a locally wirelessly telecommunicated signal of a first frequency (i.e., radio) is telecommunicated in a first-frequency local transceiver. The first frequency signals are converted to second frequency (i.e., optical) signals and further telecommunicated along a chosen directional path. (See, Col. 7, lines 19-26; 42-47). This chosen directional path is described in greater detail under the heading "3. Second Aspect of the Invention: A Telecommunications Method Upon a Mesh Network" and Acampora describes how an

optical signal is communicated over a mesh network of arrayed nodes by a plurality of directional free-space optical signals. (See, Col. 7, lines 49-59). Generally, this section of the description teaches away from the present invention, because Acampora's mesh network of highly focused optical links and a picocell covering a small area to surmount the problem of cross-talk teach away from network routing employing free-space optical broadcasting.

For the foregoing reasons, Applicant respectfully disagrees with the Examiner's position that Acampora discloses network routing employing free-space optical broadcasting, and requests that Claims 7-8 and 14-15, as well as any claims that depend therefrom, be allowed.

Respectfully submitted,

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